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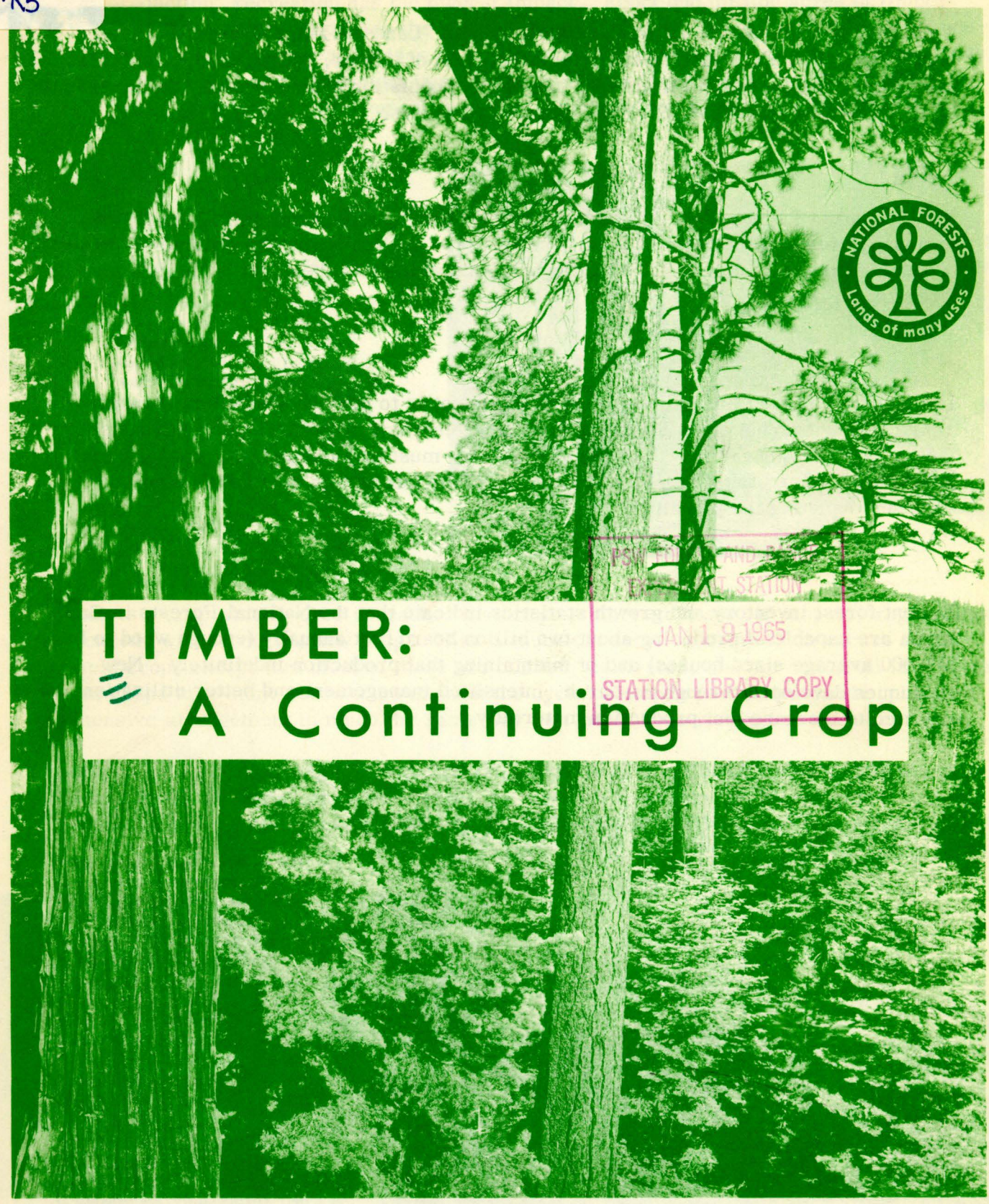

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TIMBER: A Continuing Crop

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California Region

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TIMBER: A Continuing Crop

National Forest lands are accurately described as "Lands of Many Uses." Foresters managing these lands must consider the production of timber, water, forage, wildlife, provisions for recreation for an ever increasing population and, above all, the protection of all resources from fire, erosion, insects and disease.

The California Region of the Forest Service manages nearly twenty million acres of National Forests in the State. Of that, about 8-1/4 million acres are capable of efficiently producing timber as a crop. This excludes lands which have been set aside in wilderness-type areas.

The objective of sustained yield forest management is to provide a continuous supply of timber products from lands managed so as to protect and preserve basic resources. This means that annual growth and annual harvest must be balanced over the long run. It can be compared to an investor who draws off the interest on his capital annually while not depleting the principal.

Present forest inventory and growth statistics indicate that the National Forests in California are capable of producing about two billion board feet annually (enough wood to build 200,000 average sized houses) and of maintaining that production indefinitely. New techniques developed through research, intensified management and better utilization are expected to increase that production materially.

The scene at left typifies some of the management decisions facing foresters in their management of the National Forests. In the foreground is a brushfield capable of producing timber which is presently understocked. Behind that is a heavy mixed conifer stand. In the background are openings (grasslands, meadows or brushfields), more timberlands and finally the steep, barren slope of a high mountain – in this case, Mt. Shasta. Recreation areas may be present along roads and streams, and private lands are frequently interspersed throughout. (Incidentally, the brushfield in the foreground has been cleared of brush and planted to pine trees since the picture was taken).

While all resources are considered in the management of timber croplands and each affects timber production, recreation has the biggest impact. About one million acres of timber cropland are adjacent to or provide the background for zones of concentrated recreation use – campgrounds, picnic areas, roadsides of heavily traveled roads, streamsides and lakefronts. On these areas, timber management is modified to favor esthetics, thereby reducing the timber production per acre in comparison to sites managed for maximum production.

Right – Mammoth Road, Sierra National Forest–A heavily used recreation road. The area was logged two years ago. A very light harvest along the road and complete disposal of slash has preserved the scenery. Future harvesting will be directed toward salvaging dying trees and eliminating those which are a hazard to forest visitors. Similar methods are used on other areas dedicated to outdoor recreation.

Timber is a crop which, after it reaches maturity, is harvested and, if properly regenerated and tended, will produce a new crop. This is much the same process which occurs in farming field crops except that most of those are planted, cultivated, and harvested all in one year; timber crops take many years to go through the cycle. Timber production can be increased by intensive management in much the same way that field crops respond to intensified care.

Presently, much of the timber in our forests is over-mature. Growth rates are slow and losses by death and decay are high. Here, the first job is to harvest the old growth and replace it with healthy fast growing young timber.

Young trees (seedlings) of some species are able to establish themselves and grow in the partial shade of older trees, particularly when openings occur in the stand through death of old trees. These seedlings grow slowly because they do not get enough light through the canopy above them and must share moisture with well developed root systems below them. Ultimately, the old trees will die off and the young ones will replace them. Once released, the young trees put on growth rapidly until they themselves are mature and then growth slows or stops altogether.

To speed up growth, some of the stagnated old trees are harvested. By opening up the stand and leaving adequate seed trees, conditions can be created which encourage seedlings to grow.

Left – A mature pine being felled for harvest (note the low stump which assures maximum utilization of the tree and helps preserve scenic beauty). The young pine and fir growing near the base of the tree and in its shade will make faster growth since the competition for light and moisture is lessened. Bare spots will be seeded by adjacent trees left for that purpose.

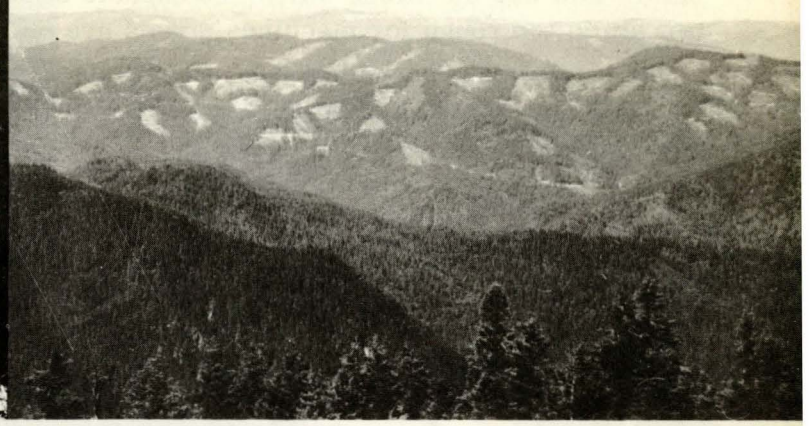
Right – Pine seedlings are thriving in openings created by harvesting mature pines (note the stumps). In this area clumps of seed trees were left to assure reforestation of all openings created by the logging. With the competition of the old trees eliminated, the young trees will grow rapidly.

Left – Successful establishment of pine after harvesting of mature trees.

Brush has come into the area but too late to greatly hamper the growth of the young trees. However, if brush invades before the trees are well established it must be removed. Otherwise, the trees will be at a disadvantage.

Some species do not establish themselves well under mature trees. Such stands will regenerate more efficiently with the complete removal of all mature trees and other vegetation. This land must then be planted or seeded because the seed source has been removed. The whole process compares closely with the harvesting and subsequent planting of agricultural crops except, of course, for the time required to grow the crop to maturity.

A typical Douglas-fir stand in Northern California. In mature stands such as this, the rate of growth is slow and the density of the stand prevents young trees from establishing themselves. Stands such as these often grow on steep slopes and shallow soils. Partial harvest (selective cutting) of the timber usually results in heavy losses from windthrow, insects, and disease. To avoid such losses, the timber is clear cut in blocks.



Clear cut blocks in a Douglas-fir stand. Blocks vary in size depending upon terrain, prevailing wind and condition of the stand. These blocks are planted with Douglas-fir seedlings. Some natural seeding takes place from nearby standing timber but normally it is slow and unreliable and competing vegetation becomes established first. This impedes the growth of those trees which are able to get started.

Douglas-fir seedlings five years after having been planted in a clear cut block. Percentage of survival is excellent and with their rapid growth the young trees have far outstripped competing vegetation.

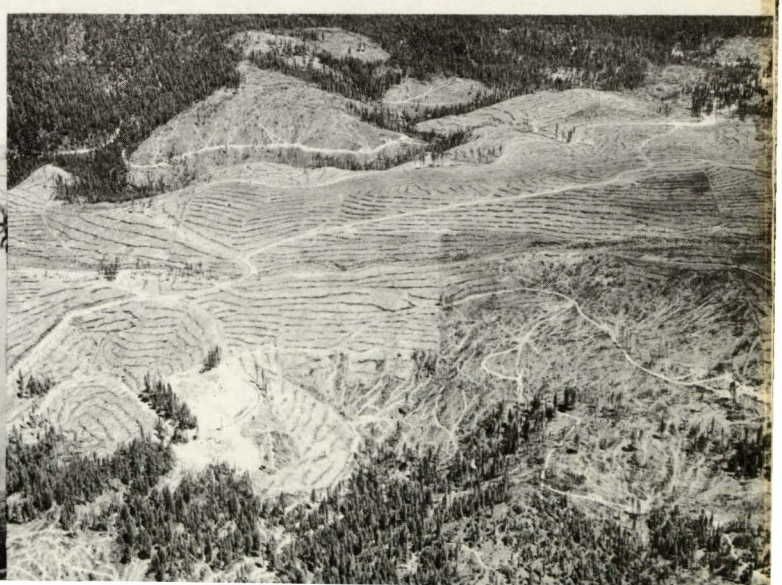
On most forest lands regeneration follows closely and is actually a part of the harvesting operation. Other lands are not now growing timber. These have been denuded by fire or some other cause and have remained nonstocked or sparsely stocked for many years. Many large brushfields were created by fires prior to the establishment of the National Forests. Many of these, having excellent timber producing potential but lacking a timber seed source, now support only brush which protects the watershed but is otherwise of little value.

In order to reforest this land, the brush must be cleared; then young trees planted. Foresters now use machines which are capable of planting large acreages rapidly. Where terrain is too rough for machines, trees are planted by hand.

Left – A brushfield after brush has been cleared and piled in windrows. Below – Trees being planted.

When a fire occurs in timber croplands the timber killed by the fire is harvested immediately. The burned area is then planted or seeded as soon as the harvest is completed and debris and competing vegetation cleared away.

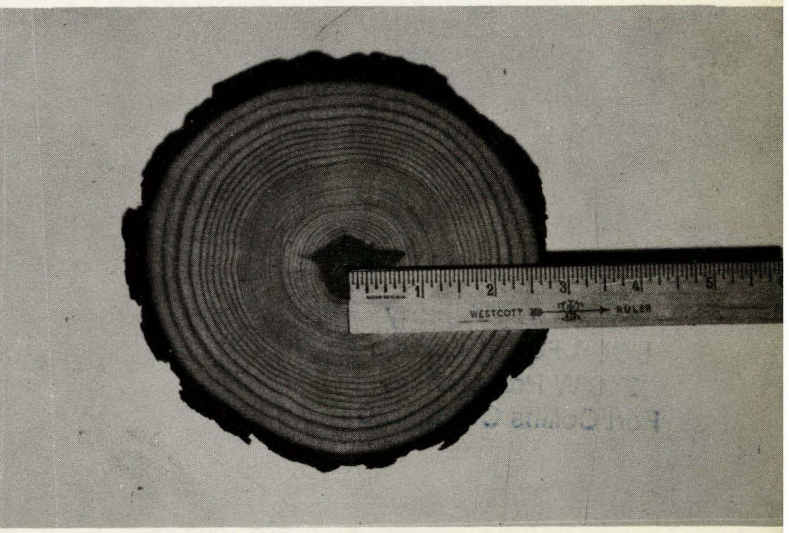
Below – A stand of fire killed timber. Right – A similar area after salvage logging, clearing and planting. Such lands may also be contour trenched to prevent erosion.



In order to fully utilize the growing potential of the site, the stand must be managed so each tree adds the maximum growth possible each year of its life. Adequate spacing is essential to maximum growth. Trees compete with each other as well as with other types of vegetation for light and moisture. Usually this competition is the limiting factor in growth. Many stands tend to stagnate when competition becomes acute.

This fine plantation will need thinning in a few years to assure continued fast growth.

The larger the trees become the more space each needs to obtain an adequate supply of light and moisture. Therefore, as the stand grows older it is necessary to reduce the number of trees per acre. Several thinnings may be made during the rotation period. Trees removed in thinnings early in the rotation are usually too small to be of commercial value but later thinnings are large enough to be processed into wood products. Naturally, the more of these products which can be sold the less the cost of thinning the stand.



The first thinning in the young stand generally takes place when the trees are less than six inches in diameter. The picture on the left above shows forest workers thinning a young pine stand. The results of such thinning are shown by the annual rings in the cross section shown in the photo on the right. This young pine, which was released about 11 years ago, shows fast early growth which lasted about 17 years (from the center of the cross section to about 7/8 inches radius), then about 20 years of slow growth (to 1-1/2 inch radius) while the tree was competing with others for light and moisture. Finally, growth speeded up after the thinning of the stand so that at the time the tree was cut it was again growing rapidly, probably as fast as possible for the site where it was located. Notice that it took about six years (from about 1-1/2 to almost 2 inch radius) for the tree to recover after being released before it began its final rapid growth. During this time it was developing its root system and crown which had deteriorated while the tree was competing with other trees. Twice as much wood was produced by this tree in the 11 years after it was released than during the 20 years while it was suppressed.

In 1961, the late President Kennedy transmitted "A Development Program for the National Forests" to the Congress. This report, prepared by the Department of Agriculture, outlined a ten year program for the National Forests, and also defined the long range objectives of the multiple use management of these lands. It emphasized the need for more than doubling, by the year 2000, the amount of timber produced in 1960 to meet the anticipated need for wood and wood products.

Privately-owned timber lands also play an important part in meeting this ever-growing need for wood. Meeting the demands of an expanding economy is an important job on private forest lands as well as those belonging to the public.

For the National Forests in the California Region this means:

1. Harvesting the full allowable sustained yield through timber sales.

2. Intensifying management of existing timber stands thereby increasing growth and, consequently, the allowable harvest volume. This includes doing timber stand improvement work (mainly thinning) on about 90,000 acres each year.

3. Growing more and better trees on lands not now producing at their full capacity by clearing and planting to trees almost 100,000 acres annually.

4. Reducing losses from disease, insects and fire.

5. Making better use of all parts of the tree and all tree species to reduce waste.

6. Through research, seek better ways to speed up tree growth and produce more usable wood per acre.

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A research forester measures the growth of hybrid trees being developed at the Institute of Forest Genetics at Placerville, California. Hybrids give promise of faster growth, and higher resistance to drouth, insects, and disease.

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